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SHAPING SUSTAINABILITY IN THE NEW SPACE ERA: FROM GUIDELINES TO RESPONSIBILITY

Adithya Variath[*]

Abstract

Sustainability has been at the centre stage of United Nations discussions over the last two decades; however, it was always limited to its terrestrial understanding. The debate of extending sustainability to outer space is a new development. From the rise of private actors and the emergence of large constellations to the proliferation of space launches, the issues of regulating space equitably and sustainably have opened a new realm of debate. As a response to this growing furore, in 2019, the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) adopted a set of 21 voluntary, non-binding Guidelines for the Long-term Sustainability of Outer Space Activities (LTS Guidelines). This article reviews the progress in the context of almost six years since the adoption of the LTS Guidelines. While it was an ambitious step towards ensuring the responsible use of space, these guidelines face several limitations. The growing complexity of space governance, lack of enforceability, and limited national regulations have questioned the long-term compliance of the LTS guidelines. The article also delves into the challenges of the LTS guidelines with the rise of new soft norms like the Artemis Accords, which introduce parallel regulatory frameworks and create further fragmentation of space sustainability norms.

Keywords: Artemis Accords – COPUOS – Due regard – LTS Guidelines – Mega-constellations – Outer Space Treaty – Space sustainability

Introduction

The way that humans use space is changing quickly. The space industry is expanding at a rate never seen before, and it is expected to be worth $1.8 trillion by 2035. Commercial companies and private endeavours are spearheading a new space era of exploration and utilisation. Space is also becoming a contested and competitive environment due to the exponential growth in satellite launches, improvements in space mining, on-orbit servicing, and deep-space missions, as well as the emergence of mega-constellations. From ideas of lunar mining to military use, something

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peculiar in humanity's six decades of space exploration reveals that launching spacecraft has become considerably more affordable. This unprecedented growth has made sustainability a major topic in space policy discussions. The question of how to make space sustainable has become more critical due to increased worries about orbital overcrowding, space debris, militarisation, and unclear governance procedures. The current global space governance system and international space law remain weak. The lack of a governance architecture allows space exploration to proceed virtually unchecked. Although the term 'sustainability' finds casual mentions in several national space laws and policies, it is frequently used in imprecise and unenforceable terms, which leaves gaps in regulatory supervision and accountability.

As of March 4th, 2025, the satellite tracking website *Orbiting Now* lists 11884 active satellites in various Earth orbits. Due to this, space traffic has increased exponentially, with new space actors entering the domain. Space has also become a highly contested zone due to high-powered military activities. According to the *European Space Agency*, "[in] more than 60 years of space activities, more than 6050 launches have resulted in some 56450 tracked objects in orbit, of which about 28160 remain in space." LEO has turned into an orbital cemetery for a variety of reasons. For example, the intentional destruction of the Chinese Fengyun-1C spacecraft in 2007, the testing of ASAT by a select group of states, and the unintentional collision between an American and a Russian spacecraft in 2009 alone have increased the large orbital debris population in LEO by about 70%, increasing the risk of collisions for spacecraft operating in low Earth orbit. According to NASA, there are about 6,000 tonnes of materials in low Earth orbit, making space junk a major concern. Removing space debris from LEO is also costly and requires investments in technology and coordinated international cooperation. This situation exemplifies the 'tragedy of the commons'.

The COPUOS established a Working Group in 2010 to address the issue holistically after some states expressed concern in the early 2000s about the increasing orbital congestion and the spread of space debris. The task of researching this subject and developing a set of voluntary, best-practice guidelines for the long-term sustainability of space activities fell to the Working Group on the Long-Term Sustainability of Outer Space Activities. These recommendations are a set of globally accepted minimum standards for ensuring and enhancing space operations. They cover the aspects of space activities that deal with policy, technology, international

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cooperation, and capacity building. The LTS Guidelines are also a result of experiences and challenges faced by various stakeholders, including governments, private actors and international intergovernmental organisations.

Some new space states initially opposed this working group, believing that the major space nations were trying to increase the obstacles to entry into the 'space club' under the guise of space environment concerns.[1] It took some time for the problem to gain traction inside COPUOS, but from around 2010, the long-term sustainability of outer space operations took centre stage in its agenda. In its 47th session, the Scientific and Technical Subcommittee of COPUOS established a Working Group on the LTS of Outer Space Activities under the chairmanship of Peter Martinez of South Africa in 2010.[2] After an eight-year process, COPUOS established a set of twenty-one recommendations for the long-term sustainability of space operations, known as the "LTS Guidelines," in June 2019 with the unanimous approval of all ninety-two of its member states at the time. The recommendations are brief, action-oriented sentences known as "guideline titles," which are followed by more detailed guidance.

These recommendations are a set of globally accepted baseline standards for improving space operations safety and guaranteeing the long-term viability of space activities. They cover the aspects of space activities related to policy, regulations, operations, safety, science, technology, international collaboration, and capacity building. The experiences of governments, international intergovernmental organisations, and pertinent national and international non-governmental organisations, in addition to a considerable body of knowledge, form the basis of the LTS Guidelines. Both governmental and non-governmental organisations can benefit from the rules. LTS Guidelines include within its ambit "planned or ongoing and to all phases of a space mission, including mission design, launch, operation, and end-of-life disposal". Several states have stated in their COPUOS statements that they are committed to implementing the guidelines nationally and have begun reviewing their current regulatory frameworks in order to modify or adopt new laws to effect the guidelines. In their deliberations and procedures pertaining to the approval and continuous oversight of national space operations falling within their purview and/or control, regulators are beginning to incorporate the use of guidelines.

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The LTS suffers from some inherent paradoxes and wool-gathering. While the LTS largely focuses on sustainability *for* space, a broader, comprehensive framework is required for sustainability *in* space and sustainability *from* space. The traditional conceptions of sustainability have been terrestrial; there is a need to preserve space as a natural resource, while the rising commercial actors view it as an area for further exploitation. One of the fundamentals for strengthening sustainability lies in also protecting orbital data, as it plays a key role in formulating responses to the growing sustainability concerns and generating quantifiable outcomes.

Outer Space Treaty and Sustainable Use of Space: Surviving the test of time?

The Outer Space Treaty (OST) of 1967 serves as the foundational legal framework governing activities in outer space and plays a crucial role in promoting sustainability. By establishing space as the "province of all mankind," the OST underscores the principle of equitable access and the peaceful use of outer space. OST also mandates that space activities should be conducted with "due regard" to other actors, implicitly encouraging responsible and sustainable exploration. Furthermore, Article IX emphasises the need to prevent harmful contamination of celestial bodies and Earth's environment, aligning with contemporary sustainability concerns. However, the OST lacks specific enforcement mechanisms and does not fully address modern challenges like space debris, resource exploitation, and increasing commercial activities. While the treaty lays the groundwork for sustainable space governance, complementary agreements and updated regulations are necessary to ensure long-term environmental and operational sustainability in the evolving space landscape.

Article VI of the OST reads that "States Parties to the Treaty shall bear international responsibility for national activities…whether such activities are carried on by governmental agencies or by non-governmental entities.". In this sense, the LTS Guidelines apply to commercial space actors' space operations to the degree that the relevant state decides to put them into effect. At the same time, private sector operators are rapidly accumulating a great deal of operational knowledge in both the safe execution of space activities and the handling of various emergency scenarios in orbit. With the emergence of satellite constellations, it is more important than ever to ensure smooth information sharing between operators to manage unanticipated situations when thousands of satellites are continuously changing their orbits.

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The emergence of very big constellations has sparked worries about orbital congestion, but it may also present a chance to build commercial capabilities that would improve space sustainability. The private sector is working hard to create technologies that will enable safe end-of-life disposal as well as a variety of close-proximity activities in orbit, including on-orbit servicing, refuelling, and other life-extension treatments. All of these technologies will support the space economy's future expansion. The development of a satellite servicing industry is still hampered by the absence of precise, generally acknowledged technical and safety standards.

Article IX has its origins in the discussion of peaceful space usage, specifically the issues brought up by the West Ford experiment and high-altitude nuclear tests carried out since 1961. The USSR denounced the West Ford project as a "military criminal experiment" and claimed that the US had carried it out without consulting the international scientific community. From then on, COPUOS was tasked with tackling the issue of the potential negative effects of space experiments. In response to the need for a scientific approach, on May 20, 1964, the International Council of the Scientific Union's Committee on Space Research adopted a resolution on "No harmful interference from Westford experiment" along with five further recommendations. In light of these recommendations, COPUOS requested that all Member States that were thinking about carrying out space experiments consider the potential impact of their operations on other peaceful uses and submit information on different parts of the experiments so that the effects might be assessed. Principle 6 of UNGA Resolution 1962 (XVIII), which served as the foundation for the eventual wording of Article IX, also included these suggestions. In addition to cooperation and mutual aid, the first statement describes the "due regard" principle that would govern states' actions in outer space.

This idea serves as a broad restriction on the freedom of exploration and usage guaranteed by Article I, requiring nations to make sure that the exercise of their rights in space does not impede the activities of other nations. This limit is a duty for all Member States in this regard and is justified by the fact that space is a shared resource, as mentioned in the "province of all mankind" clause. However, in reality, it was discovered that ambiguities in the interpretation of Article IX's second sentence limited the impact of this clause, which reads as follows: "States Parties to the Treaty shall pursue studies of outer space, including the Moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination

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and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter and, where necessary, shall adopt appropriate measures for this purpose."

The term 'contamination' in the context of any space activity may arise from launches to satellite operations that could lead to deterioration of the outer space environment. This is why a strict interpretation of 'contamination' would lead to a total ban on outer space activities. However, Article IX does not prohibit any kind of contamination, but only one which is considered 'harmful'. Therefore, in order to understand the scope of this prohibition, the meaning of 'harmful' must be established. There is no consensus on the interpretation of the notion of harmfulness in the context of outer space activities. This is to be read in the systematic context of Article IX of the OST. This means that the due regard principle should be taken into account in evaluating the concept of harmfulness. The environmental law jurisprudence of the term 'due regard principle' requires states "to consider the corresponding interests of other states parties when making use of outer space." In this respect, contamination is harmful when it disrespects the interests of other States, by undermining the usability of outer space to some degree. It is at this point that Article 31 of the 1969 Vienna Convention on the Law of Treaties, 'general rule of interpretation' can be applied to interpret the phrase 'harmful contamination' by bringing to bear the doctrine of sustainable development as a 'general principle of law'.

According to *NASA's Space Sustainability Strategy*, "orbital debris is defined as all human-made objects, including fragments and elements thereof, that are in Earth's orbit or re-entering the atmosphere and that are nonfunctional." In this respect, debris is likely to fall under the scope of the term 'contamination', which encompasses any form of pollution. Article IX OST can be seen as a State's obligation of self-regulation in the common interest of all. The first space debris mitigation document developed in an international forum was adopted by the Inter-Agency Space Debris Mitigation Committee in 2002 and then updated in 2007. It contains several definitions and detailed provisions applicable to the planning, design and operation of a space mission. Using the IADC Space Debris Mitigation Guidelines as a starting point, the UNCOPUOS drafted the UNCOPUOS Mitigation Guidelines, a less technical instrument consisting of seven general guidelines that can be grouped into three major categories: "(1) prevention of the

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release of debris during normal operations, (2) post-mission disposal, and (3) collision avoidance." It is considered a non-binding resolution and its voluntary character is emphasised by the text itself, providing that: "Member States and international organisations should voluntarily take measures to ensure that these guidelines are implemented".

There is a need to develop national rules and licensing frameworks on the use of nuclear power sources in outer space and draft regulations on the future of space transportation systems. For example, the UK Space Agency invested in the *Earth & Space Sustainability Initiative*, which is working with industry, insurance and finance communities to devise a set of global transparent space sustainability standards. However, financial issues ranging from investments in research and development and technical issues like the trackability of small satellites often impede voluntary national initiatives. For example, the Indian Space Policy 2023 has used the term 'sustainable(ility)' thrice. Nevertheless, many states lack operational duties and obligations pertaining to sustainability or debris removal that are well-defined.

Apart from threatening critical space infrastructure, the growing problem of debris also increases operating costs for commercial actors. There should be an incentive-based market model to encourage compliance with standards and to put the policy into practice. In most of the existing national frameworks, operators usually submit a space debris mitigation plan without proper ex-post monitoring mechanisms. The existing command and control models offer no or limited incentives to commercial actors to mitigate the generation of space debris.

The legal reaction to the growing conflict between space use and space debris production has not been as successful and efficient as it should have been. At the same time, the international community has not succeeded in creating a set of legally binding standards to govern space sustainability. With the increase in the private sector's interest in and readiness to carry out space operations in recent years, national laws, policies, and regulations are required to support active debris removal, on-orbit servicing, and ownership transfer.

Artemis Accords and Sustainability

Space has evolved into a special place for political and economic interactions that benefit people. Due to increased state involvement and economic interest, space is

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becoming a sector that requires cooperative agreements and regulation to avoid significant hazards. In addition, this raises the crucial topic of responsibility in several ways, such as appropriate behaviour and consideration for future generations. Space sustainability has rarely been the subject of soft law processes used to try to regulate space since the Moon Agreement in 1979, after which the global community put a halt to multilateral treaty-making in space. With an important focus on sustainability, the Artemis Accords drafted in 2020 by NASA proposed a framework for "the sustainable human exploration of the solar system". The Accords advances sustainability through tenets like responsible resource use, transparency, interoperability, and the peaceful use of space, building upon the Outer Space Treaty of 1967.

The Artemis Accords was positioned as a critical step in ensuring that future space missions do not result in the careless exploitation of resources or environmental damage but rather contribute to the longevity and shared benefits of space activities by encouraging international cooperation and sustainable exploration. Section 11(2) of the Accords affirms "that the exploration and use of outer space should be conducted with due consideration to the LTS Guidelines."

In line with the general objectives of LTS, the Artemis Accords promotes responsible behaviours including information exchange, debris reduction, and the peaceful use of space. However, there are inherent problems with the Accords. It includes provisions for establishing Safety Zones (Section 11), which are areas around lunar operations that are designated to avoid interference. Although their goal is to improve operational security and coordination, they run the risk of establishing quasi-sovereign claims over lunar territory, which goes against the non-appropriation concept of the Outer Space Treaty. These areas might restrict fair access to lunar resources, preferring countries with more developed technology and possibly resulting in discriminatory actions. The conflict between promoting sustainability and unintentionally permitting resource monopolisation is highlighted by this contradiction in the Artemis Accords, which calls for more transparent governance procedures to guarantee that space is sustainable and accessible to everyone.

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Conclusion

Space activities need to be sustainable over the long term, but they suffer from the collective action problem. Significant progress has been made in encouraging responsible behaviour and international cooperation in space governance, almost six years after the LTS Guidelines were adopted. It was ambitious to think that the guidelines would support the development of national practices and safety frameworks for conducting outer space activities. However, the lack of effective normative standards that encourage openness, debris reduction, and best practices for sustainable space operations, is detrimental to the growing space economy. However, 'non-binding' does not necessarily mean 'non-legal', space-faring nations have a responsibility towards the global commons. There is an overarching need to develop an Environmental Impact Assessment model for pre- and post-satellite launches. Debris removal and satellite maintenance have the potential to spur future advancements in the construction of extremely massive structures and the production of goods like space-based renewable energy. While norms play a critical role in shaping technological advancements, space-faring nations will have to promote private investment in early-stage orbital debris management, space situational awareness, space traffic coordination, and space environmental understanding. While the debate about sustainable fuels has gained momentum in the aviation sector, rockets also use fuels like kerosene that generate sizeable greenhouse gases. However, the effects of these deposit pollutants in outer space are still largely unexplored. In terms of space junk, some early-stage start-ups have focused on debris retrieval and removal. From a technical viewpoint, sustainability-driven companies are working on redesigning the life cycle of satellites from production, testing, transportation, and launch to use and re-entry of satellites in line with sustainability and waste reduction. It is time for the space community to quickly advance multi-lateral partnerships and capacity-building initiatives on technology to improve and apply the rules and regulations, and make investments in the global in-orbit servicing sector.

Notes and References:

[*]The author is an Elizabeth Moir Scholar at the Oxford India Centre for Sustainable Development, reading an MSc in Global Governance and Diplomacy at the Oxford Department of International Development, University of Oxford. Previously, he worked

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as an Assistant Professor and Coordinator, Centre for Research in Air and Space Laws at Maharashtra National Law University, Mumbai.

[1] Peter Martinez, 'Implementing the Long-Term Sustainability Guidelines: What's Next?', *Air and Space Law*, Vol. 48, 2023, pp. 41-58, p. 45.

[2] Peter Martinez, 'The UN COPUOS Guidelines for the Long-term Sustainability of Outer Space Activities', *Journal of Space Safety Engineering*, Vol. 8, No. 1, 2021, pp. 98-107, p. 100.

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PROTECTION OF INTERESTS IN AIRCRAFT OBJECTS ACT 2025: INDIAN SKIES ARE STILL MURKY

Prof. (Dr.) Sandeepa Bhat B.[*]

Abstract

Despite India's accession to the Cape Town Convention in 2008, aircraft financing in India did not reach its expected level. This was due to the fact that the remedies available to overseas aviation financiers were not effectively enforced in India, and due recognition was not given to the irrevocable deregistration and export request authorisation (IDERA), which is the major tool under the Cape Town Convention for the enforcement of rights by overseas financiers. There were many instances wherein the Director General of Civil Aviation (DGCA) refused to enforce IDERA upon the request of overseas financiers. The absence of a domestic law to enforce the Cape Town Convention in India has been contended as one of the major reasons for justifying the refusal. Though there were multiple efforts to develop municipal laws in tune with the Cape Town Convention, India succeeded in passing a law only in 2025. This legislation is viewed as a major impetus in attracting aviation investments in India. However, Indian concerns are not yet over. A couple of provisions in the 2025 Act take away the merit of passing an aviation financing law in India. Hence, probing into those provisions and rectifying them is essential for ensuring the smooth flow of aviation financing in India. In this context, the present article first delves into the reasons leading to the enactment of the 2025 Act. The next two parts of this article cover two major aspects. First among them is the inconsistency in the provisions of the 2025 Act, and the second aspect is the need for supplementary rules to effectively implement the Cape Town Convention.

[***** Please Note: This article is in continuation of a previous article titled "Turbulence in Indian aviation financing sector: time to understand and implement the Cape Town regime in the true spirit", which was written by the current author and published in the Uniform Law Review before the enactment of the 2025 Act. In order to avoid the overlap, the issues that existed before the 2025 Act are not discussed in detail in this article. For a detailed analysis of those issues, the readers may go through: Sandeepa Bhat B., 'Turbulence in Indian aviation financing sector: time to understand and implement the Cape Town regime in the true spirit', Uniform

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Keywords: 2025 Act - ADR mechanisms - Bhartiya Vayuyan Adhiniyam - Cape Town regime - IDERA - International Registry

Introduction

Airline insolvency has been one of the most significant challenges faced by the Indian aviation sector over the years. This has been triggered by multiple factors, including indiscriminate airline licensing, high levels of taxation, regulatory uncertainties, unhealthy competition amongst airlines, and lack of consumer affordability. The turbulent past of the Indian aviation sector has had a serious negative impact on foreign direct investment in this sector. Buying aircraft and establishing a fleet requires heavy investments, which is extremely difficult to mobilise without cross-border investments. Due to the lack of investments, Indian airlines rely heavily on leased aircraft and aircraft engines for their operations. In comparison to the 53% global average, the Indian commercial fleet consists of 80% leased aircraft. Hence, the profitability of Indian airlines is dependent on getting leased aircraft and aircraft engines from overseas lessors at a highly competitive price.

The overseas lessors need a transparent and predictable legal regime to repose faith in leasing their costly assets. In case of default by the lessee or airline insolvency, the lessors want immediate remedies to recover their assets. The lessors' recovery of aircraft or aircraft engines is preconditioned on some procedures to be followed under international and domestic norms. While the deregistration of aircraft is required under the Chicago Convention 1944, domestic laws governing taxation, and import and export also need to be followed before taking back the aircraft or aircraft engines to the lessor's State. Aircraft leasing is a type of asset-based financing, which creates a non-possessory security interest in favour of the lessor. Interests created in cases of credit financing and conditional sale of aircraft or their parts also possess the same feature. Unfortunately, some States do not recognise or only partially recognise non-possessory security interests. Those jurisdictions would always have difficulties in mobilising overseas aircraft leasing or financing. However, India, being a common law country, conceptually recognises non-possessory security interests. Despite this, the Indian aviation sector suffered seriously due to various

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administrative hurdles and legal uncertainties surrounding the repossession of aircraft and aircraft engines. Though the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act 2002 (SARFAESI Act) was introduced to deal with the enforcement of security interests in India, it does not apply to security interests in aircraft with the express exclusion under Section 31(c).

Indian Accession to the Cape Town Regime and the Aftermath

The problem of aircraft financing is not limited to India, especially due to issues in cross-border financing. An international regime to deal with manifold issues relating to it was found essential to build the confidence of lessors/financiers. The International Institute for the Unification of Private Law (UNIDROIT) attempted to develop a regime suitable for aviation financing by adopting the Cape Town Convention and the Aircraft Protocol (together referred to as "the Cape Town Regime") in 2001. The Cape Town Regime provides for the creation of international interest, registration of interests for maintaining transparency, a fixed rule of priority among competing interests, default remedies, and remedies in case of insolvency of debtors. Once the debtor's State is a party to the Cape Town Regime, remedies to the financiers are guaranteed irrespective of contrary national laws. Thus, the creditors' confidence to invest in the aviation sector is boosted.

After an initial reluctance, India acceded to the Cape Town regime in 2008. This move was expected to settle concerns associated with investments in the Indian aviation sector. However, problems associated with aviation financing persisted due to poor implementation of the Cape Town regime in India. Indian authorities at various levels have failed to respect IDERA, which is a major tool available to the overseas financiers under the Cape Town regime for deregistration of aircraft and export to their countries. Roadblocks created by the DGCA, the Airports Authority of India (AAI), the Insolvency and Bankruptcy Code (IBC) 2016, and the Commissioner of Customs were witnessed in a series of cases after Indian accession to the Cape Town regime. *DVB Aviation Finance Asia PTE Ltd.* case, *Aer Lingus Ltd.* case, *Corporate Aircraft Funding LLC.* case, *Awas 39423 Ireland Ltd.* case, *Wilmington Trust SP Services (Dublin) Ltd.* case, *LCI Helicopters Eight Ltd.* case, and fourteen petitions in connection with the Go Air (India) Ltd. decided by the Delhi High Court in 2024, are among the long list of cases evidencing administrative hassles in India.

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In order to overcome difficulties faced in the above-mentioned cases, amendments were introduced to the Aircraft Rules and Civil Aviation Requirements (Section 2 – Airworthiness), and necessary exceptions to aircraft were made under the IBC. Despite these reforms, foreign investment in the Indian aviation sector did not increase substantially. The need for implementing the Cape Town regime through the legislative process was felt as a prerequisite for building the confidence of overseas financiers. In this direction, two attempts were made in 2018 and 2022 by drafting the Cape Town Convention Bill 2018 and the Protection and Enforcement of Interests in Aircraft Objects Bill 2022. However, neither bill advanced through the legislative process. Ultimately, the Protection of Interests in Aircraft Objects Act 2025 (2025 Act) was passed with an expected entry into force date of 1 May 2025. Meanwhile, the Bhartiya Vayuyan Adhiniyam was passed in 2024 to replace the Aircraft Act 1934. This legislative change was also aimed at modernising the Indian aviation sector and promoting ease of doing business.

Persisting Problems

The 2025 Act contains only 12 sections and incorporates the Cape Town Convention, Indian declarations under the Cape Town regime and the Aircraft Protocol as part of three schedules. Section 3 of the 2025 Act declares the application of the Cape Town regime relating to aircraft objects in India, subject to declarations deposited by India. A sigh of relief was expressed by the aviation industry and other stakeholders immediately after the passage of the 2025 Act. However, a careful reading of the 2025 Act shows that problems still persist in Indian aviation financing, especially due to the faulty drafting and the failure to comprehend the essence of the Cape Town regime. Sections 8 and 9 of the 2025 Act require a detailed analysis in this context.

Section 9(1) of the 2025 Act states that "In the case of any inconsistency between a provision of this Act and any other law for the time being in force, the provisions of this Act shall prevail to the extent of such inconsistency." This appears like a non-obstante clause giving an overriding effect to the 2025 Act as against any other inconsistent law. Such an overriding effect for the implementation of the Cape Town regime is expected in accordance with India's international commitments. However, the very next sub-section mentions, "Save as otherwise provided in this Act, the provisions of this Act shall be in addition to, and not in derogation of any other law

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for the time being in force." Application of this provision will effectively take away the overriding effect provided under the previous sub-section. Understandably, these two conflicting clauses cannot appear simultaneously in a statute, since it will create uncertainties in the implementation. Their parallel presence in the 2025 Act is a reflection of faulty drafting.

If Section 9(2) of the 2025 Act is made applicable, remedies available to the overseas financiers in the Indian aviation sector will be subject to the provisions of other laws applicable in India. The Companies Act 2013 requires a charge held by a foreign company to be registered under Section 77. In its absence, a charge will not be considered by the liquidator in bankruptcy proceedings. This operates as an additional burden on foreign investors since they have to register their charge not only under the Cape Town regime but also under the Companies Act 2013. Such an additional requirement is in contravention of the Cape Town regime. While many foreign investors may not even know about this requirement, there will also be unnecessary additional costs incurred by them in the process of registration under the Companies Act 2013. In addition, the goods and services tax (GST) clearance under the Central Goods and Services Tax Act 2017, and the airport charges and fee clearance under the Airports Authority of India (Management of Airports) Regulations 2003 create more obstacles to overseas financiers in realising their interests.

Under Article 39 of the Cape Town Convention and the Indian declarations lodged during its accession, the GST clearance and the airport charges and fee clearance may be justified to some extent. However, the registration under the Companies Act 2013 cannot be mandated as per the Cape Town regime. Going by the principle of *pacta sunt servanda*, the overriding effect of the 2025 Act needs to be upheld. In the wake of Indian obligations under the Cape Town regime, a defence of applying a contrary municipal law will not hold good. Such an attempt will go against Article 27 of the Vienna Convention on the Law of Treaties 1969, which rejects the justification for the failure to perform a treaty on the basis of a contrary municipal law. Either by amending the Companies Act 2013 or by invoking the power to remove difficulties, one may consider the option to recognise the registration of a charge under the Cape Town regime as a deemed registration under the Companies Act 2013. However, this cannot be a preferred option as the implications of other laws on the exercise of remedies by overseas financiers will remain unaddressed.

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Section 9(3) of the 2025 Act stipulates the power to arrest or detain an aircraft for the payment of dues associated with it. This is based on the Indian declaration under Article 39(1)(b) of the Cape Town Convention. Though Section 9(3) rectifies several mistakes made in the Indian declaration due to the improper paraphrasing of the text of Article 39(1)(b) of the Cape Town Convention, the provision still falls short of being free from mistakes. In conferring the right of arrest and detention, Section 9(3) stipulates it to be available to "…the Central Government or *any entity thereof*, or other provider of public services in India, or any intergovernmental organisation in which India is a member…" The use of the words "any entity thereof" here is not in tune with Article 39(1)(b) of the Cape Town Convention, since the latter grants such rights only to "State entities". Hence, interpretational concerns regarding the rights of private entities to arrest or detain an aircraft under this provision are expected in future.

In terms of jurisdiction under the Cape Town regime, Section 8 of the 2025 Act confers it to the High Court having territorial jurisdiction. This is in accordance with the Indian declaration under Article 53 of the Cape Town Convention. However, this takes away the option of resorting to alternative dispute resolution (ADR) mechanisms in resolving aviation financing disputes. Litigants in contemporary commercial disputes are predominantly taking the route of arbitration and mediation owing to their efficiency and involvement of experts. The ordinary courts in India are, in contrast, impeded by a lack of specialised knowledge and considerable delays in the administration of justice. Indian high courts are already overburdened with pending litigations, and thus, speedy disposal of cases by them cannot be expected. Further, appeals to the Supreme Court further prolong the final disposal of cases. Such protracted enforcement of rights results in the devaluation of aircraft assets, which operates against the interests of financiers. In light of this, an overseas investor will not be confident enough to invest in the high-stakes aviation financing. If the 2025 Act aims to promote foreign investment in the Indian aviation sector, it must provide the overseas investors with the option of resorting to ADR mechanisms to obtain speedy relief.

Supplementary Rules

The proper enforcement of the 2025 Act also requires supplementary rules to be formulated at the earliest. The two most important aspects in this regard are the

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deregistration of aircraft and the designation of entry point/s under Article XIX of the Aircraft Protocol. For the purpose of the de-registration and export of aircraft, Section 7 of the 2025 Act makes reference to the Bhartiya Vayuyan Adhiniyam and the rules made thereunder. Interestingly, Section 10(2) of the Bhartiya Vayuyan Adhiniyam misses out "de-registration of aircraft" and "export authorisation" as separate entries in enumerating the rule-making power of the Central Government. However, the generality of Section 10(1) is adequate enough for the Central Government to formulate the requisite rules. It is most significant to develop and publish a clear set of norms to respect IDERA, and allow the de-registration and export of aircraft in the process of overseas investors realising their interests.

One of the most significant aspects for availing remedies under the Cape Town regime is the registration of interests over aircraft assets in the online International Registry. With the consent of both the debtor and the interest holder, either party may request the Registrar to register the international interest in the International Registry. Though the Registrar makes necessary arrangements for registration of communicated interests, the Registrar has no obligation to enquire into the validity of consent given by either party for such registration. This might result in registering some interests that are not valid due to the lack of consent from either party. Consequently, invalid entries in the International Registry may undermine the much-needed transparency and predictability that the Cape Town regime seeks to establish. In order to avoid this, one of the options available is to designate entry point/s under Article XIX of the Aircraft Protocol for transmission of information to the International Registry. Since the entry points can filter out the applications submitted without proper consent, the rules to be made by the Central Government under Section 10 of the 2025 Act shall designate the requisite number of entry points to check the validity of interests claimed over aircraft assets.

Concluding Remarks

The Cape Town regime is a complicated system emanating from an effort to unify conflicting private laws governing aviation financing. Nearly two decades of the Indian experience, after the accession to the Cape Town regime, indicate the poor understanding and implementation of the regime. The 2025 Act is a positive step in the direction of respecting Indian obligations under the Cape Town regime. However, the incorporation of conflicting provisions and taking away the option of

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resorting to ADR mechanisms have seriously prejudiced the effectiveness of the legislation. While these provisions need to be overhauled, the Central Government needs to formulate concrete rules regarding the de-registration and export request, and the designation of entry point/s under Article XIX of the Aircraft Protocol for building confidence in Indian aviation investments.

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* LL.M., Ph.D. Professor of Law, Director – Centre for Aviation and Space Laws, The WB National University of Juridical Sciences, Salt Lake City, Kolkata. First UNIDROIT Correspondent for India.

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DEVELOPING PRINCIPLES OF CORPORATE HUMAN RIGHTS DUE DILIGENCE FOR OUTER SPACE USE AND EXPLORATION: A CRITICAL EVALUATION

Anna Marie Brennan[*]

Abstract

Corporations are predicted to dominate outer space use and exploration for the foreseeable future. With tentative plans in development for humans to live and work permanently on celestial bodies, what responsibilities will corporations have to observe human rights? It is thought that reform of outer space law is needed to embrace non-state actors to not only delineate their precise legal status but also their rights and responsibilities in outer space. Not only would this pronouncement of rights and responsibilities provide transparency and certainty for corporations, but also for 'humankind' as business enterprises such as SpaceX, Blue Origin and the Sierra Nevada Corporation endeavour to make the first leap to establish human communities on celestial bodies. This article will consider the extent to which corporations will need to embed human rights due diligence in their activities on celestial bodies and what measures they will need to adopt to assess, mitigate and remediate human rights violations.

Keywords: Commercial Responsibility – Corporation – Due Diligence – Human Rights – Outer Space – UN Guiding Principles

Introduction

Several business enterprises, including Blue Origin, SpaceX, and the Sierra Nevada Corporation, have announced ambitious plans for humans to live and work on celestial bodies by the end of the 21st century. However, concerns are growing about how corporations will exercise human rights due diligence in these communities. Clause 11 of SpaceX's Terms of Service Agreement, which affirms 'Mars as a free planet and that no Earth-based government has authority or sovereignty over Martian activities,' amplifies these concerns. While some experts suggest that the clause supports the non-appropriation principle under Article II of the Outer Space Treaty, it could also authorise human rights breaches, particularly torture, arbitrary

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killings, discrimination and the denial of fundamental freedoms such as liberty of movement. Indeed, scholars such as Jennifer Brobst and Kimberley McKinson warn that Earth's history of violent colonial legacies could be repeated in the 'outposts of outer space' and international space law's silence on the issue of human rights compounds the problem. There is growing disquiet about how human rights can be protected in outer space to preserve the realm as a 'shared international commons' for all humankind. With the growing supremacy of corporations in outer space, is it inevitable that they will prioritise their business interests, with the ultimate goal of profit maximisation at the expense of human rights? Since there is still no international treaty regulating business enterprises in outer space, this article considers whether the UN Guiding Principles on Business and Human Rights (UN Guiding Principles) could provide a starting point for corporate human rights due diligence. In particular, Guiding Principle 15 provides that business enterprises must 'identify, prevent, mitigate, and account for how they address their impacts on human rights' and rectify 'any adverse human rights impacts they cause or to which they contribute.' This article will consider the degree to which space companies will be required to exercise human rights due diligence in outer space and especially what mechanisms they will need to adopt to evaluate, mitigate and remedy human rights impacts. While the UN Guiding Principles specify that it is a 'global standard of expected conduct for all business entities' and 'exists independently of States' abilities and/or willingness to fulfil their own human rights obligations,' this article will explore whether a bespoke human rights due diligence mechanism needs to be developed for business enterprises operating in outer space.

The UN Guiding Principles and the Corporate Responsibility to Protect Human Rights

Scholars are increasingly concerned that the international legal framework is ineffective in regulating corporations engaged in outer space use and exploration. Zeldine O'Brien, Bartisz Ziemblicki and Yevgeniya Oralova opine that the aim of the five main outer space treaties is to regulate state conduct[1]. However, Article VI of the Outer Space Treaty indirectly provides for corporate accountability by proclaiming that states must 'bear international responsibility for national activities in outer space … whether such activities are carried out by government agencies or non-governmental entities.' Unfortunately, the definition of 'non-governmental entities' is not articulated in Article VI, and neither does it outline the precise duties

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of non-governmental actors. No guidance is also provided on how states should monitor the conduct of corporate actors or how liability should be attributed to them for breaches of outer space law. As Yuan notes, outer space law was crafted at a time when the eventual rise of space companies was not foreseen. This has arguably led to a legal vacuum where the legal status and duties of corporations in outer space remain contested and unclear. With little guidance from the United Nations Office for Outer Space Affairs, which supports states to develop domestic legal frameworks to regulate outer space use and exploration, evidence is emerging that such 'legislative measures continue to fall short of ensuring their legal accountability and responsibility for potential and actual human rights impacts.' With the increasing possibility that humans will eventually live in outer space, research on the extent to which space companies are obliged to observe human rights due diligence is vital.

Adopted unanimously in 2011 by the UN Human Rights Council, the UN Guiding Principles could provide a foundation for establishing future human rights standards for corporations in outer space. In particular, they emphasise the policies and processes that business enterprises must adopt to 'know and show' they respect the human rights of stakeholders and understand global society's expectations. Indeed, a comprehensive study conducted by Rachel Davis on corporations conducting business in armed conflict zones found that 'there has been an incentive for business to engage with these expectations as governments, investors, civil society organisations, and others increasingly use the Guiding Principles as the benchmark for assessing companies' human rights performance.' While they do not create new duties and obligations under international law, the Guiding Principles strive to be a 'blueprint for the steps all States and businesses should take to uphold human rights.' Embracing the 'Protect, Respect, and Remedy' model, the 31 Guiding Principles affirm that all types of business enterprises have an independent responsibility to respect human rights and in doing so must exercise human rights due diligence to identify, mitigate and confront the impact of their business activities on human rights. Human rights that corporations have a responsibility to observe include those laid down in the Universal Declaration of Human Rights 1948, the International Covenant on Civil and Political Rights 1976, the International Covenant on Economic, Social and Cultural Rights 1976 and the International Labours Organisation's Declaration on Fundamental Principles and Rights at Work 1998 (as amended in 2022). Moreover, human rights violations can also be asserted by the corporations themselves. Article 17 of the Universal Declaration of Human Rights,

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for instance, provides that 'everyone has the right to own property alone as well as in association with others [and] [n]obody shall be arbitrarily deprived of his property.'

As noted by John Ruggie and John Sherman, the UN Guiding Principles distinguish between the duty of states to protect and enforce human rights within their territorial boundaries and the responsibility of businesses to protect human rights in the conduct of their enterprises. In particular, they note the corporation's responsibility is neither based on nor analogous to state-based law. It is rooted in a transnational social norm, not an international legal norm. It serves to meet a company's social licence to operate, not its legal licence, as Ruggie proclaims. However, the use of the phrase 'responsibility to protect' was intended to signify the non-legal binding nature of the Guiding Principles. Even though corporations may be considered "organs of society," they are specialised economic organs, not democratic public interest institutions. As such, their responsibilities cannot and should not mirror the duties of States."[2] Crucially, a corporation's responsibility to protect 'exists independently of the State's ability or willingness to meet its own duty to protect human rights.' In particular, the Commentary to Principle 11 of the UN Guiding Principles provides that the responsibility 'exists over and above compliance with national laws and regulations protecting human rights.' Thus, if a state opts not to legislate to protect a particular human right, corporations engaging in business enterprise from this location nevertheless have a responsibility to observe this right.

Challenges Addressing Human Rights Due Diligence in Outer Space

The precise application of the phrase 'human rights due diligence' as delineated in the UN Guiding Principles in the outer space context remains to be seen. Compounding this dilemma is the fact that two different meanings of the phrase are apparent from a reading of the UN Guiding Principles, despite no admission in the document. As discussed elsewhere, '[i]n business, the term is used frequently to describe methods to manage commercial risk' while human rights lawyers, on the other hand, harness the phrase to describe 'a standard of conduct required to discharge an obligation.' As noted by Bonnitcha and McCorquodale, the UN Guiding Principles provide no guidance on how both meanings of the phrase are harnessed in the document and how they intertwine in the context of business and human rights. Without clear guidance, there are concerns that this 'encourages the

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incorrect view that implementing due diligence processes is sufficient to discharge businesses' responsibility to respect human rights … and may encourage "tick-box" exercises that allow businesses to claim that they are compliant with the Guiding Principles.' Consequently, how can the UN Guiding Principles be regarded as a valid expression of the conduct expectations of corporations in outer space when the level of conduct needed to satisfy the 'responsibility to protect' threshold is not clearly delineated. The often dangerous and unpredictable nature of outer space use and exploration exacerbates this dilemma. If human rights due diligence is intended to be a continuous exercise, Bonnitcha and McCorquodale have suggested that one construal of the UN Guiding Principles is that businesses will only be held responsible for human rights violations that arise from their 'failure to act with reasonable diligence.' So, if a company has endeavoured to exercise human rights due diligence during the conduct of its activities in outer space, it will not be held responsible if unforeseeable human rights violations occur.

Another understanding of the UN Guiding Principles is that a space company will be regarded as having breached its human rights responsibilities whenever a violation occurs, even if it could not have been reasonably foreseen. If this interpretation of the UN Guiding Principles is to be accepted, a space company will be compelled to provide a remedy even if they have exercised human rights due diligence. However, future research is needed on what body at the international level would be able to take action to ensure that a remedy is provided. Potentially, the UN Security Council would have a role, by encouraging states to comply with their obligation to protect human rights and ensuring that victims of corporate human rights violations have access to a remedy. Academics such as Bonnitcha and McCorquodale clearly believe the second approach is most consistent with a reading of the UN Guiding Principles as a coherent whole and with international human rights law. Thus, space corporations would not only be responsible for the human rights impacts of their own activities but also potentially those of third parties with whom they have a business relationship. Very little research has been conducted on the potential human rights impacts of state and corporate activity in outer space, and the practicality of applying the UN Guiding Principles. It is also essential to highlight that not all scholars agree with Bonnitcha and McCorquodale's construal. For instance, Ruggie and Sherman argue that it is not 'aligned with the Guiding Principles, and they fall well short of the Guiding Principles' own scope for the

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conditions of enterprises' responsibility to respect human rights and provide for or contribute to, remedy.'

While there is a global trend towards encouraging corporate self-regulation, space companies have yet to develop human rights due diligence policies, and undoubtedly, compliance with the UN Guiding Principles will be difficult to monitor in the outer space environment. At the same time, the UN Guiding Principles do not provide guidance on whether space companies will need to adopt a generic human rights due diligence policy or ensure that due diligence is incorporated into all its existing systems and processes, especially its health and safety, environmental, oversight and governance mechanisms. Human rights treaties and conventions have been specifically tailored for Earth-based living conditions, and while researchers have started to consider the scope and application of human rights in outer space, no research has examined whether it will ever be legitimate or even necessary to restrict fundamental rights and freedoms due to the perilous environment. Nevertheless, space companies are increasingly engaged in discussions on developing sustainable outer space use and exploration. The Space Industry Statement in Support of International Commitments to Not Conduct Destructive Anti-Satellite Testing, which was launched by the Secure World Foundation in November 2023, seeks to encourage sustainable outer space activity. Over forty companies have signed up to the initiative, signalling the 'growing involvement of private space actors in promoting the sustainability of outer space.' Other mechanisms to emerge from the space industry in recent years include the Net Zero Space Initiative and the Space Safety Coalition. While these initiatives not only indicate that an increasing number of space companies recognise the need to engage in sustainable outer space activity, which could serve 'as a foundation for further legal development,' they also suggest a willingness to perhaps develop a set of bespoke principles for human rights due diligence in outer space.

Nevertheless, there is evidence emerging that some space companies may decline to adhere to specially tailored principles and instead require individuals travelling or residing in outer space to sign human rights waivers. SpaceX, for example, has not yet become a member of any of these initiatives despite being one of the foremost players in the industry. Nevertheless, the Commentary on Principle 18 provides that business enterprises must show a commitment to assessing its actual and potential impact on human rights 'prior to a proposed business activity' and also 'prior to

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major decisions or changes in the operation (e.g. market entry, product launch, policy change, or wider changes to the business); in response to or anticipation of changes in the operating environment (e.g. rising social tensions); and periodically throughout the life of an activity or relationship.' Thus, the scale and scope of the impact on "affected stakeholders" will need to be taken into careful consideration before a company conducts outer space activity. The findings of its human rights impact assessment will also need to be incorporated into decision-making processes and remedial steps taken to prevent human rights impacts. While it is beyond the scope of this article, an interesting line of future research inquiry would be to examine the potential role of non-governmental organisations, such as Human Rights Watch, to monitor the human rights impacts of corporate activity.

As specified in UN Guiding Principle 18 and its Commentary, space companies will need to utilise international human rights treaties and conventions 'as a reference point' for 'meaningful consultation with potentially affected groups and other relevant stakeholders,' especially 'individuals from groups or populations that may be at heightened risk of vulnerability or marginalization, and bear in mind the different risks that may be faced by women and men.' Since Article 1 of the Outer Space Treaty 1963 provides that the 'exploration and use of outer space … shall be carried out for the benefit and in the interests of all countries, and shall be the province of all [hu]mankind,' can a compelling argument be made that space companies should be encouraged to publish the outcome of consultations on the human rights impacts of their activities? Indeed, the Commentary to Principle 23 provides that they must 'consult externally with credible, independent experts, including Governments, civil society, national human rights institutions and relevant multi-stakeholder initiatives.' Arguably, states and humankind are space companies' largest stakeholders, and future research needs to examine how consultations on the potential impact of their outer space activities on human rights will be conducted. Could the United Nations Committee on the Peaceful Uses of Outer Space, for instance, be harnessed as a vehicle for such consultations? Or would a different forum to facilitate and steer consultations be preferable and more effective?

As discussed above, it is conceivable that some space companies may decline to observe the UN Guiding Principles and may even argue that they do not apply to their outer space activity. However, Principle 23 states that they must 'respect internationally recognised human rights, wherever they operate ….' Space

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companies must also 'treat the risk of causing or contributing to gross human rights abuses as a legal compliance issue.' While future outer space exploration will lead to an exponential increase in the number of humans living and working in outer space, it will nevertheless remain a dangerous and isolating activity where compliance with the UN Guiding Principles will be challenging. Nevertheless, the Commentary to Principle 23 provides that space companies will be 'expected to respect the principles of internationally recognised human rights to the greatest extent possible in the circumstances and be able to demonstrate their efforts in this regard.' In view of the tentative plans to conduct space resource utilisation activities as well as establish installations on the Moon and Mars, how can corporations ensure that human rights breaches are avoided, not just by the company but also by its directors, executives and general employees? Future research and discussion are urgently needed to assess whether new guiding principles on human rights due diligence specifically tailored to business activity in outer space are needed.

At present, the UN Guiding Principles provide no guidance on how space companies should evaluate whether a potential human rights breach is severe. Instead, they are recommended not to conduct themselves in a way that could 'exacerbate the situation.' To alleviate the breach, they are required to carry out 'cross-functional consultation within the enterprise', but very little guidance is provided on how business enterprises should conduct this. With the multitude of different actors concerned with outer space use and exploration, 'cross-functional consultation' may prove arduous for space companies. As John Sherman contends, it is not the case that 'a company's responsibility to respect all human rights should be vested in a company's legal department and made a matter solely of legal compliance and legal risk.' On the contrary, Principle 23 (b) provides that businesses will need to modify how they conduct their enterprise by finding 'ways to honour the principles of internationally recognised human rights when faced with conflicting requirements.' A considerable challenge is the fact that many prominent space corporations are registered in the United States. Even though the United States is a signatory party to the International Covenant on Civil and Political Rights, it has vehemently rejected its extraterritorial application. It also withdrew from the negotiations for the UN Draft Treaty on Business and Human Rights for similar reasons. Crucially, if a state declines to authorise a space company to launch from its soil due to concerns about failures to observe human rights, there is a possibility

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that the business enterprise will simply shift its operations to a country with more relaxed human rights monitoring processes.

Space companies are at a crossroads and will need to think carefully about how operating in the outer space environment could lead to human rights violations. One way for companies to respond to this potential risk would be to consult not only with human populations, who will potentially live and work in outer space, but also with non-governmental organisations such as the International Institute for Space Law, the Secure World Foundation and the Mars Institute, as well as psychologists and medical and human rights experts. While there is increasing awareness of the impact that the outer space environment has on the human body and mind, ongoing consultation with communities living and working in outer space will be important. Without more comprehensive guiding principles, it remains to be seen how space corporations will achieve this meaningful consultation.

Concluding Thoughts

The above analysis suggests that despite the UN Guiding Principles having gained considerable support since their inception, the international community will need to carefully explore a range of policy and regulatory approaches for business enterprises to protect human rights in outer space. Unfortunately, guidance has yet to be developed on how corporate human rights due diligence in outer space can be monitored, given the remote and perilous environment. The UN Guiding Principles clearly provide that a space company must exercise human rights due diligence even if a state has not legislated for a particular human right. However, concerns are growing that space corporations will have relative freedom to select which human rights they will safeguard and the process by which they will do so. To prevent this from occurring, new international principles to guide human rights due diligence in outer space need to be designed. In addition, an independent body to monitor how and to what extent corporations are implementing these principles needs to be instituted. The effectiveness of this proposed mechanism, and whether it is likely to be supported by space companies and the international community, is beyond the scope of this article. Empirical research is needed to determine whether the proposed mechanism would likely dissuade space companies from perpetrating human rights violations, not only due to the reputational risk but also potential extraterritorial legal claims, both civil and criminal. Space companies will need to

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demonstrate a commitment to operating and administering extraterrestrial settlements safely and with integrity if they are to encourage individuals to reside there. It remains to be seen what mechanisms space companies will invoke to achieve human rights due diligence and succeed in their ambitions.

Notes and References:

[*] Author is a Senior Lecturer at the University of Waikato, New Zealand.

[1] Zeldine O'Brien, 'To Boldly Go? Private Contractors for the Carriage of Persons in Space, Exclusion Clauses and Inter-Party Waivers of Tortious Liability', *Dublin University Law Journal*, Vol. 29, 2007, pp. 341-373.

[2] John Ruggie, 'Business and Human Rights: The Evolving International Agenda', *American Journal of International Law*, Vol. 101, 2007, pp.819-840 at pp. 826-827.

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TWO MANUALS, ONE DOMAIN: A CLOSER LOOK AT THE DIVERGENCES AND INCLUSIVITY IN SPACE SECURITY LAW

Kiran Mohan Vazhapully[*]

Abstract

In the field of space security law, the McGill Manual on International Law Applicable to Military Uses of Outer Space (MILAMOS project or McGill Manual) and the Woomera Manual on the International Law of Military Space Activities and Operations (Woomera Manual) reflect stark differences. This article starts by looking at the different trajectories of the McGill and Woomera Manuals, including their beginnings and development. Then, it briefly explains the split between these two expert groups and attends to the reasons behind it. Perhaps more importantly, the article veers onto look at this crucial question: do these manuals adequately represent the perspectives of developing States, or are they missed opportunities for inclusivity, which potentially perpetuates biases against the Global South in space governance? By unpacking and dissecting these issues, the article tries to shed light on the convolutions and consequent challenges of crafting effective legal norms in an increasingly contested domain.

Keywords: Global South – Inclusivity – MILAMOS – Space security – Woomera

Introduction

Expert manuals are unique on the complex canvas of modern international law. As documents written by leading scholars and practitioners in the field, they seek to clarify and detail aspects of legal matters on which treaties and customary law may not clearly or comprehensively pronounce. They also help in identifying areas of disagreement, and offer guidance on how these rules should be applied in practice. Despite not being legally binding, they are influential guides on what is *lex lata*—the law as it is currently understood. According to Article 38(1)(d) of the Statute of the International Court of Justice, the teachings of the most highly qualified publicists are considered a subsidiary means of determining rules of law.

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Acclaimed experts prepare these manuals, which lend them a quasi-authoritative status and enable them to considerably influence rule interpretation and practice. There are a few well-known examples of such manuals in international law—like the San Remo Manual on International Law Applicable to Armed Conflicts at Sea and the Tallinn Manuals on the International Law Applicable to Cyber Warfare (Tallinn 1.0 and Tallinn 2.0). These manuals, post their publication, have proved to be exceptionally methodical interpretative aids and highly persuasive to the extent of influencing State practice. Also, their role in offering practical guidance in arriving at informed, legally sound decisions in their operational areas is well recognised.

It is against this background that one should look at the McGill Manual and the Woomera Manual. They both are important contributions to the space security paradigm. The MILAMOS project, led by McGill University, Canada— in collaboration with Cologne University, Germany, and other institutions around the world—works to clarify legal principles governing military uses of outer space in peacetime, including challenges to peace. Contrastingly, the Woomera Manual, prepared by a consortium of universities in Australia, the United Kingdom, and the United States, covers the applicability of international law to all phases of military space activities, and this includes armed conflict. Put differently, these manuals pursue different approaches to similar problems. The MILAMOS project focuses on peacetime legal constraints. The Woomera also deals with legal challenges of an armed conflict involving outer space. This divergence in ideology and consequent approach palpably animates a broader fragmentation in international space law- a branch of public international law that is still struggling to keep up with rapid technological advances, authoritarian regimes and geopolitical frictions.

Origins and the Disagreement

International space law is a product of Cold War-era geopolitics, not utopian visions of order and equity. Its current form is the result of radioactive tensions and the hard-fought rivalry between the United States and the Soviet Union, which dictated and defined the scaffold of fragile cooperation in outer space. These rival States saw treaty-making as an obvious path to checkmate each other's hitherto unrestrained space militarisation plans. The 1967 Outer Space Treaty (OST), the first of these treaties and the only space treaty that directly deals with space

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weapons, is now universally acknowledged as the foundation of space governance. It established the law against placing nuclear weapons and other weapons of mass destruction in orbit.

Yet the language of its de-weaponisation provision, Article IV, essentially mirrored the politics and concerns of its time. It conspicuously permitted conventional space weapons and, through its "peaceful purposes" phrasing, effectively perpetuated classified spy satellite programmes. It is made for an age when just two States had spacefaring capabilities. Understandably, technological advancements, complexities of space military operations and an increase in the number of States with space-faring abilities left many of the consequent modern concerns unaddressed, exposing significant gaps in the OST. With no new legally binding instruments likely to be concluded in the near foreseeable future, initiatives such as McGill and Woomera Manuals have a greater significance in interpreting and articulating how existing international space law applies to military uses of outer space.

The McGill project (MILAMOS) stems from Wing Commander Duncan Blake's - graduate research in 2014, which Professor Ram S. Jakhu supervised. Blake, in his dissertation titled "Manual on International Law Applicable to Warfare in Space," identified a clear need for a universal manual that would set out the legality of military operations in outer space. The McGill Institute recognized the relevance of this prescription in the context of proliferation in the testing of anti-satellite (ASAT) weapons and developing electronic warfare capabilities that are capable of degrading GPS constellations, creating cascading risks for civilian infrastructure dependent on space-based services.

With generous funding from the Erin J.C. Arsenault Trust Fund and a grant from Canada's Social Sciences and Humanities Research Council (SSHRC), the project was officially launched in May 2016 at McGill University. The predominant goal was to produce a policy-neutral manual codifying international consensus on rules of the road for military uses of outer space. In their own words, the main objective was to "develop … a manual that objectively articulates and clarifies existing international law applicable to military uses of outer space, including the conduct of hostilities in outer space and military activities in periods of tension."

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During the deliberations of MILAMOS, differences arose internally regarding its exclusive focus on peacetime legal principles. MILAMOS deliberately avoided engaging with the specifics of armed conflict, focusing instead on pre-conflict scenarios and general principles like non-intervention, non-interference, and self-defence. This cautious approach stemmed from concerns about maintaining the peaceful purposes principle enshrined in the OST and avoiding legitimising space warfare. However, some experts in the group were of the opinion that this was insufficient at a time when space conflicts seemed inevitable, and a legal framework for military space activities should also consider wartime situations.

Some experts also felt that MILAMOS was overly academic and theoretical and not sufficiently grounded in military realities. A few members of the original group, like Michael Schmitt, felt that some members were not sufficiently objective. This caused a rift in the group, with a few experts arguing that the conversations were not balanced enough to receive a diverse range of perspectives and were instead being monopolised by a few voices or subject to "groupthink". These strong disagreements prompted a group of experts to establish the Woomera Manual project.

The Woomera Manual project was named after a South Australian township with a history of space launches. It was institutionally led by the University of Adelaide, the University of Nebraska College of Law, the University of New South Wales—Canberra, and the University of Exeter. The project sought to analyse the application of international law in the context of all stages of military space activities in a comprehensive manner. That includes armed conflict as well. The aim was to fill in gaps left by MILAMOS by specifically addressing, for example, targeting principles and proportionality in the context of space warfare, providing a more practical approach to military space law. A significant point of contention was how existing treaties, most importantly the OST, should be interpreted with the laws of armed conflict (LOAC), to offer actionable guidance for decision-makers in contested environments.

The project closely looked at actions such as jamming of satellites to see if they cross the international law thresholds of a "use of force" or an "armed attack." The Woomera Manual, which is the output of the project, concluded that LOAC principles should apply to military operations in outer space in wartime. But it

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recognises that some space law provisions may still apply so long as those are not at odds with the norms of LOAC. What stands out here is the effort to incorporate both space law and LOAC to regulate military operations in space meaningfully.

Missed Opportunities for Inclusivity

Both MILAMOS and Woomera Manuals certainly brim with ambition in their scope and intent. However, if one flips through their drafting histories and development process, one cannot help but notice a familiar pattern. They have palpable inclusivity issues- voices from the Global South are barely a whisper. This cannot be dismissed as innocent procedural oversights. The same structural biases that continue to undermine the equitable development of international law are present here too. What is at risk here? By sidelining emerging space actors, whether by oversight or design, these projects risk cementing a legal regime that caters to established powers while leaving most States floating at the margins.

Institutional leadership tells the story quite clearly. MILAMOS is based at McGill University in Canada, and Woomera originated from renowned universities in Australia, the UK, and the US. The result is predictable. Working groups of these exercises were dominated by Western academics, practitioners, and military personnel from States with advanced space capabilities. MILAMOS drew its core contributors predominantly from North America and Europe (Annex III provides the details), and the Global South barely registered. Woomera had a more troubling pattern. Its expert team comprised almost exclusively of Australian, British, and American participants, showing no evidence of meaningful developing State involvement.

This geographical parochialism is reminiscent of criticisms that have been directed at the Tallinn Manual process on cyber warfare. Scholars like Lauri Mälksoo noted how Tallinn Manual 1.0 became dominated by experts with "American and Old European backgrounds," systematically sidelining the possibilities of alternative viewpoints. These representational gaps not only distort the substantive content of such manuals but also fundamentally compromise their legitimacy as authoritative interpretations. The real danger lies in how legal analysis becomes myopically focused on issues that matter primarily to advanced spacefaring States. By failing to engage meaningfully with experts and institutions from the Global South, MILAMOS and Woomera seem to have fallen into the same trap. This matters

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because expert-driven processes like these get their quasi-authoritative status not from any formal legal mandate, but from their ability to harness broad-based expert consensus among relevant stakeholders.

Both projects did attempt to present themselves as inclusive. But a closer look easily reveals that these efforts are more like tokenism than genuine engagement. MILAMOS organised workshops and outreach events in countries such as India, China, and Russia. But these functioned primarily as dissemination venues rather than platforms for consequential participation in the drafting process. Woomera's state consultation process was not much better. It involved as many as 24 countries, but the process heavily favoured States with well-established space programmes. This lack of any significant outreach efforts to developing nations or regional organisations is indeed a missed opportunity for incorporating diverse perspectives from across the globe. Excluding major regions from these processes virtually guarantees that their outputs will not gain broad international legitimacy. Sensitised by the criticism Tallinn 1.0 received, the Tallinn 2.0 process exhibited a greater awareness of these exclusionary concerns. Organisers sought to bring in voices and feedback from non-Western States like China and Belarus. That said, Tallinn 2.0 is far from perfect by any stretch. In fact, it hardly represents the gold standard for inclusivity. However, these efforts did lead to better ways of engaging with States beyond the traditional Western circle. At minimum, they recognised that geographical diversity actually matters for credibility.

Anecdotal assertions frequently suggest, sometimes quite bluntly, that Global South institutions still do not have requisite academic expertise and sophistication for meaningful contribution to such projects. This perspective is both reductive and fundamentally flawed. Rather, it is indicative of broader systemic inequities in academic recognition rather than genuine capacity limitations. Such arguments need careful, unbiased scrutiny. Otherwise, they cannot be taken at face value, given their tendency to perpetuate historical exclusions within international legal scholarship.

The substantial intellectual contributions of Global South scholars and practitioners deserve more recognition in conjunction with the structural barriers that have historically constricted their participation in global governance initiatives. Certainly, many developing nations continue to grapple with resource limitations

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and institutional capacity constraints. But these challenges hardly translate into an absence of scholarly competence. One must be able to distinguish capacities from capabilities. But I have also noticed that Western institutions often take the easier route. They invite diaspora scholars who are technically from the Global South but work at Northern universities. This approach lets them claim diversity while avoiding the harder work of building genuine partnerships and engagements with experts and institutions in developing regions. This is inclusion without genuine engagement. The apparent aim is to tick boxes, not addressing the structural disproportions that keep on alienating Global South voices.

Further, it has to be emphasised in this context that the States that make up the Global South actually have a rich legacy of shaping international legal frameworks. That includes space law. When most of these States are excluded from contemporary processes, it typically comes from systemic inequities rather than concerns of any shortage of intellectual firepower. Developing nations have historically played important roles in embedding equity and inclusivity principles within international space law. An oft-quoted example is Brazil's contribution to Article I of the OST. Their insistence on guaranteeing equal exploration rights "irrespective of economic or scientific development levels" fundamentally shaped the underlying philosophy of the OST. The Non-Aligned Movement was equally influential. The Movement, during their 1964 Cairo Summit, actively pushed for space demilitarisation and equitable access. These examples are just a fraction of the Global South's substantive contributions to space governance. Several other instances could easily fill pages.

So, the under-representation of Global South experts in these projects cannot by any stretch of imagination or enquiry be attributed any intellectual shortcomings on their part by any stretch of imagination or enquiry. Rather, it comes from entrenched structural barriers and biases that favour certain institutions and certain kind of personalities over others. Both manuals are efforts of universities in developed States. These are institutions that enjoy substantial funding and have well-established networks connecting Western scholars and practitioners. Such resource concentration unsurprisingly avoids voices from regions with fewer institutional connections or limited financial means, locations they treat as inferior and incompetent.

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These barriers call for proactive solutions, not dismissive assumptions about expertise levels. The Global South actually harbours considerable expertise in space law that these projects largely overlooked. Universities across India, South Africa, and Brazil actively teach space law and have many emerging scholars and practitioners. These institutions have started serious research too. It is true that most of their scholars may still lack the publication records, CVs and prestigious affiliations of their Western counterparts. This disparity is indicative of contextual differences and institutional constraints, not intellectual limitations. Comparing them directly would be fundamentally misguided, like measuring apples against oranges. When given the opportunity, they bring entirely different perspectives which are shaped by unique historical and lived experiences with colonialism, its new forms and ongoing struggles for technological sovereignty. Throughout my career as a lawyer working for an intergovernmental organisation based in the Global South, I have encountered some brilliant minds from these regions whose contributions to international law and space law match anything produced by more traditionally recognised institutions.

Concluding Thoughts

MILAMOS and Woomera fundamentally had different approaches to space governance, and these manuals matter far beyond academic circles. They connect directly to the current debates about whether the peaceful uses principle in the OST can actually coexist with space militarisation or whether their conflict is unavoidable. Also, the differences between these frameworks have consequences for the future development of space law. Further, contradictory approaches of MILAMOS and Woomera have the potential to fuel legal fragmentation in international space governance. This fragmentation parallels the broader political divisions reshaping our world.

The codification exercise that resulted in the MILAMOS Manual seems to have chosen to align itself with multilateral efforts to prevent an arms race in space. Its ideology, in effect, is congruent with the hopes of preserving outer space as shared "global commons." Woomera takes an entirely different path. It sides with the priorities of those States that view outer space through a national security lens. This divergence has consequences. States naturally go for interpretations that go with their strategic interests. This makes consensus difficult to achieve. Expert

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manuals like these certainly offer valuable guidance, and they potentially cultivate important dialogue and future engagements, but their real impact hinges on whether States actually appreciate them, embrace them and weave them into treaty or customary law. Till that happens, legal ambiguities could easily be exploited as apologies during future space conflicts.

This divergence also points to broader questions on inclusivity and representation in such deliberations. Both manuals are susceptible to criticism for failing to include Global South voices. Historically, these regions and their peoples often find themselves pushed to the margins of global governance discussions. The absence of these perspectives certainly raises questions about the legal authority of such exercises. It also reinforces existing imbalances that favour established technological powers over emerging space actors. This pattern threatens to lock in a legal order that increasingly sidelines those on the periphery. Without correcting these exclusions, we risk creating space governance structures that serve only the interests of a select few.

If future projects want to tackle these problems in all seriousness, they need to go beyond token gestures and perfunctory insertions. The next generation of academic initiatives has to make inclusion a genuine priority, not an afterthought. This means actually reaching out to experts from developing nations and bringing them into the conversation from day one, rather than just inviting them to rubber-stamp decisions already made elsewhere.

It takes a lot of effort to build real partnerships with universities and regional organisations across the Global South. But this has to be done. Money matters too. Financial barriers almost always prevent meaningful participation, and online meetings are no solution to such lengthy, intellectually demanding exercises. So, providing support for travel, research, and collaboration becomes unavoidable in inclusivity efforts. Creating spaces where genuine dialogue can happen, rather than just going through the motions, requires intentional design and sustained commitment from the Global North until institutions in the Global South are able to stand on their own. Without these efforts, the myth of inadequate Global South expertise will persist, not because it is true, but because it is convenient for maintaining the status quo. Breaking this cycle calls for more than good intentions. It requires structural changes in how these projects operate.

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[*] The author is a Senior Legal Officer at the Secretariat of the Asian-African Legal Consultative Organization (AALCO), an intergovernmental organisation based in New Delhi. Views are personal.

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MILITARISATION OF SPACE: RECONCILING ANTI-SATELLITE TESTING WITH THE OUTER SPACE TREATY FRAMEWORK

Ranjan Kumar Srivastava[*] *& Yug Raman Srivastava*[**]

Abstract

This article examines the international legal dispute over anti-satellite missile testing (ASAT) and the international legal regime on space activities against a background of India, which has conducted a high debris-generating anti-satellite test, Mission Shakti, in 2019 over low Earth orbit. Conducting a critical analysis of salient provisions of the space treaties, the paper evaluates how the control measures in the 1967 Outer Space Treaty permit or prohibit ASAT testing. The study evaluates substantial loopholes in Article IV, which enables the development of kinetic ASATs, as there is only mention of nuclear weapons and Weapons of Mass Destruction (WMDs), and nothing is said in relation to conventional weapon systems. The study shows, through the use of textual analysis, how contemporary interpretations of Article IX in terms of "due regard" and "harmful contamination" have been shaped to potentially include acts that lead to the creation of debris. This analysis contributes to the academic understanding of how the existing principles of space law could be understood and applied in order to address emerging issues in space security governance.

Keywords: ASAT – Contamination – Due regard – Mission Shakti – Outer Space Treaty – Space debris – Space militarisation

Introduction

The confluence of space law and national security interests has come to a crossroads after India's 2019 Mission Shakti anti-satellite missile test (ASAT) unveiled the technological capabilities of the rising space nations and the inadequacies of current international legal structures. It is significant to evaluate the legal implications of kinetic ASAT testing under the 1967 Outer Space Treaty and the regulatory gaps that allow debris-producing activities by seemingly encouraging peaceful uses of space. The proliferation of ASAT technologies to spacefaring nations has provided strong arguments on interpretations of key Treaty provisions, most notably those

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relating to definitions of "peaceful purposes," "harmful contamination," and "due regard" requirements. Current global efforts to set legally binding space-based constraints on destructive ASAT testing demonstrate the immediate need to address space security issues and ongoing issues of multilateral space governance in a time of great power rivalry.

Legal Architecture of Space Activities: The Outer Space Treaty Framework

The fundamental legal framework of space activities has been established since 1967 by the Outer Space Treaty. Article I of the Outer Space Treaty safeguards the principle that "exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind." The Outer Space Treaty treats space as a global common governed by international law, emphasising equal access for all nations. It prohibits national appropriation (Article II) and mandates that space activities align with the UN Charter (Article III), linking space law with international peace, cooperation, and legal accountability.

Article IV, the Treaty's core disarmament provision, establishes a regime of partial demilitarisation of space through the careful permission and prohibition formula. The first paragraph prohibits States from placing "any objects which can carry nuclear weapons or any other kind of weapons of mass destruction", "in orbit around the Earth," and the second paragraph states that "the Moon and other celestial bodies shall be used by all States Parties to the treaty exclusively for peaceful purposes". This two-branch model establishes differentiated regimes of celestial objects and Earth orbit, where the latter is controlled more strictly.

It is categorically forbidden to militarise celestial objects, for example "the installation of military bases, facilities and fortifications, the launching of any weapon, and the military manoeuvres on celestial objects". However, the Treaty indeed allows "the use of military personnel for scientific investigation or any other peaceful purposes" and "the use of any equipment or facility required for peaceful exploration of the Moon and other celestial bodies". The exceptions recognise the dual-use nature of space technology and the rightful utilisation of military personnel in scientific pursuits.

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Here, Article IV is noteworthy for failing to prohibit space-based conventional weapons systems or conventional Earth-orbiting weapons, and therefore creating a vast regulatory vacuum. Instead of kinetic kill vehicles or other non-explosive ASAT systems, the Treaty drafters targeted nuclear weapons and mass destruction weapons. It has far-reaching implications for ASAT testing, as India's Mission Shakti test, for instance, employed a conventional kinetic interceptor rather than explosive warheads.

India's Mission Shakti: Technical Execution and Legal Implications

Operational Parameters and Strategic Context

India's Defence Research and Development Organisation (DRDO) tested Mission Shakti on 27 March 2019, kinetically destroying an out-of-commission Indian satellite to successfully demonstrate anti-satellite capability. The test used a prototype Prithvi Defence Vehicle Mark-II (PDV MK-II) interceptor, which was specifically built for ballistic missile defence requirements, to destroy Microsat-R at an altitude of approximately 283 kilometres in low Earth orbit. With this technology development, India emerged as the fourth nation, along with China, Russia, and the United States, with functioning ASAT capabilities.

The 2019 ASAT test exposed critical ambiguities in Article IX's "harmful contamination" provisions, as NASA's collision risk calculations for the International Space Station (ISS) demonstrated the Treaty's inability to quantify environmental thresholds. While India emphasised the test's 283km altitude for rapid debris decay, Analytical Graphics Inc. (AGI) modelling revealed 6,500+ trackable fragments - underscoring the need for standardised debris impact assessments in national authorisation processes. This event catalysed European Union Member States' commitment to Not Test Direct-Ascent ASAT Systems, illustrating how unilateral actions can spur normative evolution despite the Outer Space Treaty remaining static.

Mission Shakti, conducted during India's election season, also raised concerns about the intersection of domestic politics and national security. While India asserted adherence to international space law and emphasised peaceful intent, the test was also a strategic deterrence signal. Conducted at low altitude, it aimed to limit long-term space debris through rapid atmospheric re-entry. Unlike China's 2007 ASAT

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test, wherein China tested at 800 kilometres of altitude, where atmospheric pressure is not sufficient for rapid degradation of the debris.

Space Debris Generation and International Reactions

Mission Shakti also emphasised the global distribution of space debris and its impact on space safety. Shortly following the test, the U.S. Strategic Command initially reported that between 250 and 270 pieces of debris were currently tracked. However, more sophisticated modelling by AGI revealed that the actual debris field included about 6,500 objects over one centimetre in diameter, some of which were too small to be followed regularly by existing space surveillance networks.

Satellite breakup events are unpredictable, as the development of the debris field illustrates, with some pieces having longer than initially calculated orbital lifetimes. NASA Administrator Jim Bridenstine was particularly worried about the increased risk of ISS collision, as the test increased the probability of an ISS collision by 44%. This calculation highlighted the international implications of national ASAT tests, as a single State's test debris could pose a threat to the space assets of all spacefaring nations.

The international response to Mission Shakti vindicated divided views as to whether testing of ASAT is still acceptable in accordance with current space law. India insisted that the test was compliant with international legal standards, but its critics argued that creating debris amounted to dangerous pollution of outer space in violation of Article IX of the Outer Space Treaty. The United States and its Western European allies subsequently redoubled efforts to establish international controls precluding ASAT tests that generate debris.

Article IX and the "Due Regard" Obligation: Legal Interpretation and Application

Textual Analysis and Interpretive Frameworks

Their complicated task is to "conduct all their activities in outer space, including the moon and other celestial bodies, with due regard to the corresponding interests of other States Parties to the Treaty," according to Article IX of the Outer Space Treaty. It has generated considerable scholarly debate over its actual applications in the real world and how it will be enforced, rendering it one of the most contentious

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legislative provisions of the Treaty. Because of the ambiguity of the obligation, States and legal scholars have different interpretations of it, particularly in how it applies to national security space activities.

"Due regard" is a standalone obligation under space law, requiring all activities, including ASAT tests, to respect other States' interests, guided by the Outer Space Treaty's principles of cooperation and mutual assistance.

Harmful Contamination and Space Debris

Article IX specifically prohibits actions that can lead to "harmful contamination and also undesirable alterations in the environment of the Earth because of the introduction of extraterrestrial matter." The Treaty's original focus on biological contamination has evolved to include space debris as harmful contamination, especially as it hinders other States' space activities. Modern legal interpretations consider debris from ASAT tests a threat to future space use, requiring a balance between short-term contamination and long-term space accessibility.

International Responses and Regulatory Evolution

United Nations Framework and Multilateral Initiatives

A landmark change in viewing commercial space activities occurred in the 2024 UN Conference on Space Law. More than 60 States agreed to working papers on the responsibilities of the commercial space sector in the Conference, whereas the agreement to impose a ban on kinetic ASATs failed. The failure of the US-Japan WMD resolution in the UN Security Council frustrated the efforts to modernise the Outer Space Treaty. The response of the international community to the proliferation of ASAT capability in the United Nations community, especially in the Committee on the Peaceful Uses of Outer Space (COPUOS), and in the Conference on Disarmament has evoked a great deal of diplomatic activity.

A notable step toward the development of international regulation on space behaviour involves the promotion of the UN Space Debris Mitigation Guidelines that require a reduction of the number of debris emitted as part of the routine processes and the avoidance of break-up possibilities during operation scenarios. Such non-binding guidance is specifically aimed at the mitigation of space debris by technical strategies, as opposed to the placing of bans on particular practices. The

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voluntary nature of current outer space guidelines limits their effectiveness in restricting national security actions like ASAT tests, even if aligned with treaty obligations. However, recent diplomatic efforts, including UN resolutions and working groups, signal a shift toward binding space security regimes addressing military threats and debris generation.

Leadership and Coalition Building in the European Union

The European Union has taken a leading role in promoting bans on destructive ASAT testing, with its 27 member States agreeing in August 2023 to larger regional bans on such tests. Emphasising a step-by-step strategy toward future binding agreements, the EU advocates responsible behaviour and monitoring as practical measures for space security, building on earlier U.S.-led initiatives and aiming to turn voluntary commitments into enforceable global norms.

Chinese and Russian Opposition: The Mechanisms of Strategic Rivalry

China and Russia are against particular prohibitions on ASAT testing but favour general agreements on space arms control, like the 2008 Prevention of the Placement of Weapons in Outer Space Treaty (PPWT), that are not restrictive of ground-based ASATs. Their collective opposition to US efforts is symptomatic of strategic competition and divergent opinions regarding space control.

These fault lines are still present in contemporary diplomatic efforts, as evidenced by the 2024 veto of a US draft resolution "to prevent the placement of nuclear weapons in outer space" by Russia and the abstention of China. Such selective cooperation and obstruction are other signs of overall degradation in space cooperation between the US, China and Russia, and an increase in militarisation of the policy space discourse. This failure to reach an agreement on the minimum security lines in space is a sign of the world's problems of space governance in the epoch of strategic competition.

The UN Space Debris Mitigation Guidelines: An Insight

The legal interpretation of the treaty obligations through technological requirements included in the UN Space Debris Mitigation Guideline on responsible space behaviour establishes a point of reference. In Guideline 1, it has been stated that the space systems need to be designed in such a way that they do not introduce debris

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during routine operations, unless there is a need to release debris. In the latter case, the impact on the outer space environment ought to be reduced. This guideline provides standards against which debris-generating activities can be objectively assessed as satisfying the Outer Space Treaty's demand for noxious contamination and due regard.

The sources of energy have to be dissipated or safeguarded under Guideline 5, regarding "post-mission break-ups resulting from stored energy," once they are no longer utilised for mission purposes. While directed toward spacecraft operations, this directive sets the standard for assessing the necessity and proportionality of activities leading to debris. ASAT testing would be measured to this level by considering whether or not other demonstration techniques existed that would serve the same ends but without creating permanent debris fields. The acceptance of exceptions in the guidelines, "justified, for instance, by the United Nations treaties and principles governing outer space", explicitly allows for activities sanctioned by treaty provisions. Through this phrase, acceptable national security activities, including ASAT testing for defence purposes, can be sanctioned even when they produce debris as long as they are in accordance with the broader treaty requirements of peaceful purposes and due regard. However, the testing state is responsible for proving the necessity and proportionality of activities causing debris.

Guideline 4, which calls for avoiding deliberate damage and destructive acts in space, is infrequently used in analysis because it is repeated in the treaties. Binding international law is just what is called in policy discussions, although mere technical guidelines such as this are considered a secondary matter is self-evident. Furthermore, guideline 4 is regarded as implicit in the wider space governance models; therefore, it is not singled out to be put under the microscope. Its rules are already implicit in major treaties and agreements, and so explicit analysis is less frequent in high-level diplomatic or legal discussions.

Other Regulatory Initiatives and Future Directions

The development of new international space security frameworks reflects growing recognition that existing treaties are insufficient to regulate today's military space actions. UN Open-Ended Working Group on Reducing Space Threats is a major improvement in the regulation of space, tackling the military problems that were not central in conventional space law discourse. It was realised that space security could

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not be divorced from international security as a whole and that it must be addressed with specialised methods separate from civilian space cooperation.

Other recent proposals for binding limits on destructive ASAT testing have emerged in the expectation of filling gaps in the Outer Space Treaty without needing to renegotiate the Treaty. The EU's pledge to ban direct-ascent ASAT testing, which establishes regional norms potentially leading up to more comprehensive international standards, is an example of an incremental step. This strategy recognises political realities of negotiating new multilateral treaties while leaving doors open for norm development through practice and opinio juris.

Promotion of transparency and confidence-building measures (TCBMs) in space undertakings has generated new instruments for the control of military space rivalry. Pre-notice of space undertakings, establishment of consultation procedures for potentially hazardous activities, and exchanges of information on space objects and phenomena are some examples of such preventive measures. TBCMs are not legally binding, but they establish institutionalised frameworks of communication; hence, they can minimise misunderstanding that can develop into harmful conflict.

Conclusion

The Outer Space Treaty, based on the State-centric approach, is demanding urgent reform to deal with contemporary issues like the militarisation of space and ASAT tests. A possible solution to the problems posed by ASAT would be the revision of the provisions connected with space debris. A legally binding debris mitigation standard is apparently feasible as illustrated by the Zero Debris Charter adopted by the European Space Agency and signed by more than a hundred signatories. This standard could become a workable example of a future UNCOPUOS protocol to regulate the deliberate destruction of space objects and other hazardous acts, which are not yet prohibited under the Outer Space Treaty. Creation of a special dispute resolution tribunal within UNOOSA would also be useful in determining the State liabilities within the Liability Convention when damage is caused as a result of ASAT tests.

The lack of coordination among spacefaring nations is evident in terms of regulating the military use of space. The Indian Mission Shakti test shows the contradiction between national security and international sustainability in the field of space. In the

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end, the challenge of reconciliation between security and sustainability would demand strong universal and legally binding rules and multi-pronged regulation practices, aimed at governing space debris and controlling the risks of militarisation.

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* The author is a practising advocate at the Patna High Court. He is an AOR enrolled with the Bar Council of India.

** The author is pursuing a B.A. LL.B. (Hons.) degree at Rajiv Gandhi National University of Law, Punjab.

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THE WTO SECURITY EXCEPTION AND ITS IMPACT ON INTERNATIONAL AVIATION LAW

Kanchan Yadav[*]

Abstract

In the World Trade Organization (WTO) regime, the national security exceptions, as provided under Article XXI of the General Agreement on Tariffs and Trade (GATT), Article XIV *bis* of the General Agreement on Trade in Services, (GATS), and Article 73 of the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS), were intended to be a safety valve, to be used only in case of a threat to a nation's 'essential security interests'. However, after minimal invocation of the provisions in the seven decades of the GATT-WTO era, since the 2010s, there has been an increasing trend of several nations invoking the same. The economic and trade ramifications of the same aside, such invocations and resultant measures also encroach upon the fundamental aspects of international aviation law. The regulatory framework established by the International Civil Aviation Organisation (ICAO) under the Chicago Convention (1944) is grounded in principles of safety, non-discrimination, and technical cooperation in the international and national airspaces. However, without regulated enforcement mechanisms, it has no recourse to mitigate economically and politically motivated aviation restrictions – a problem that is further exacerbated due to the institutional overlap and fragmentation between the WTO and the ICAO. Under this backdrop, this paper provides a detailed analysis of the points of overlap and conflict between the WTO and ICAO security-related principles using case studies of the Russia-Ukraine airspace bans and the Qatar blockade, and aims to provide ways forward from the same.

Keywords: Airspace ban – Chicago Convention – GATT – ICAO – State discretion

Background

In 1947, as the different nations were bringing themselves under the ambit of GATT as Contracting Parties, there was a certain amount of apprehension by certain nations, which was reflected in the fact that initially, only twenty-three nations were the signatories of the same. The States were concerned that too much of their

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sovereignty was being diluted, and it would leave them vulnerable during national and international threats. To retain some of their discretion and sovereignty while still allowing for free global trade, the general exceptions and security exceptions were incorporated in GATT, under Articles XX and XXI respectively. While the general exceptions permit deviations from international trade law to protect specific aspects such as public morality, health, etc., the security exceptions are broader in nature, and allow a member nation to deviate from its obligations under GATT and the subsequent agreements, in order to protect its 'essential security interests'.

During the incorporation of this exception, it was already recognised by the Contracting Parties that the security exceptions, if misused, would have the capacity to derail the entire free trade system – and thus, must be subject to cautious use. Since 1947, the security exceptions have been rarely invoked, and have never been the subject matter of a dispute before the WTO till the 2017 Ukraine-Russia dispute. Since then, several cases on these provisions have been brought before the WTO, which, while clarifying some aspects of the security exceptions, have also posed significant questions regarding their applications in other sectors, including in international aviation.

The issue becomes prominent when the impact of security exception disputes on international aviation is analysed. In the 2017 Ukraine-Russia debacle, along with the WTO case, there were mutual closures of airspace and flight bans, which resulted in the hostilities of 2022. Similarly, during the Qatar-Gulf crisis, as Saudi Arabia was invoking the security exceptions against Qatar, several States imposed airspace restrictions on Qatari carriers. The nations imposing such restrictions were Saudi Arabia, the UAE, Egypt, and Bahrain. Particularly considering ICAO's lack of enforcement and adjudicatory mechanisms, when States use the security exceptions in such a manner that impacts not only international trade law but also international aviation law, the extent and urgency of this regulatory conflict come to light.

Security Exceptions: WTO Jurisprudence

The wording of the security exceptions is such that it permits derogation from the obligations of the Agreement, only when the 'essential security interests' of the concerned State are at stake. However, when the first ever dispute on these provisions were brought before the WTO in the *Russia – Measures Concerning Traffic in Transit* (2019) case, the primary point of contention was whether the WTO had

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any authority to determine the legality of such invocation, considering that the provisions allow the invoking nation to take actions that 'it considers necessary'. The wording of the provision brought about a self-judging aspect to the same, seemingly making the invoking nation the primary and sole authority regarding the justiciability of a trade restrictive measure implemented under this provision. After a lengthy bout of debate, this point of view was rejected by the WTO Panel. It was held that while the invoking nation was the primary authority to determine whether a measure is necessary to protect its essential security interest, it would still be subject to an objective review by the WTO on whether the measure in question is plausibly related to the identified essential security interest.

However, in spite of the wording of the security exceptions being highly ambiguous and the potential for misuse being great, the WTO did not venture too much into providing clarity on the same. As Russia took recourse to Article XXI(b)(iii) in this case, the Panel provided that an 'emergency in international relations' must exist at that time, but did not analyse further whether the emergency could be attributed to Russia's own actions. It also placed a minimal burden of proof on the invoking nation, where it had to only prove a minimum plausibility that the implemented measure is connected to the threat in question. This, seemingly, provides unfettered discretion on the invoking nation to implement more stringent trade restrictive measures for remote or non-urgent threats.

A similar dispute between Saudi Arabia and Qatar was brought before the WTO in 2020, during the *Saudi Arabia – Measures Concerning Protection of Intellectual Property Rights* case, where Saudi Arabia had invoked the security exceptions under Article 73(b)(iii) of TRIPS. A similar standard was again set by the WTO, where the invoking nation needs to only prove the existence of an 'emergency in international relations', and the implemented measures must be at least minimally connected to the security threat.

In both these disputes, while the issue in question seemed to primarily be a trade dispute resolved at the WTO level, they had significant impacts on international aviation as well. It is true that the WTO operates in the regulatory arena of trade in goods and services, and aviation-related restrictions such as airspace closures, flight suspensions, and overflight bans are not directly within its purview. However, in connection with the claimed security threat, aviation-related restrictions were placed

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by Russia on Ukraine and by different States on Qatar, and the minimal burden of proof placed by the WTO on the invoking States seemed to add that much more credibility to their actions. None of the invoking States seemed to consider the fact that the aviation-related restrictions would be subject to the Chicago Convention 1944, which did not include such a broad security exception clause. While Article 89 of the Convention could be invoked, it would only apply in cases of war or a declared state of national emergency by the contracting State, which was notified to the Council.

State Discretion under International Aviation Law

Global airspace and interactions therein are primarily governed by the Chicago Convention of 1944. Under the administration of ICAO, the fundamental principles of mutual cooperation and technical neutrality have been established as the cornerstone of international aviation law.

While the Convention allows State discretion within its airspace, such discretion is not unfettered. Under Article 11, any measure that applies within a State's airspace must be applied towards all aircraft, 'without distinction as to nationality'. This prohibits discriminatory measures from being implemented by a nation towards the aircraft of any particular state. However, similar to the security exceptions under WTO, the Chicago Convention under Article 89 allows a nation to retain freedom of action regarding its airspace during a state of war or declared national emergency.

In the context of the Ukraine-Russia dispute, while the Panel report was circulated in 2019, tensions between the two countries grew, culminating in Russia's invasion of Ukraine in 2022. In the face of such actions, several nations, including the United States, Canada, and the European Union, closed their airspaces to Russia's carriers, resulting in similar bans from Russia and a disruption of global air traffic between Europe and Russia. The imposing States claimed that such actions were taken for national security and in solidarity with Ukraine, though the potential political motive behind the same cannot be ignored. Both Russia and Ukraine sent Notices to Air Missions (NOTAM), declaring certain portions of their airspace as closed. While the ICAO acknowledged the Notices, their justiciability was not debated at this stage.

While during the enactment of such aviation-related restrictions, Russia and Ukraine were already at a state of armed conflict, the situation was much milder in the context

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of Qatar. In 2017, even before the WTO dispute was initiated, several Middle Eastern countries such as Saudi Arabia, UAE, Bahrain, and Egypt implemented an airspace ban against Qatar, alleging concerns of terrorism. Qatar brought the dispute before the ICAO, filing an application under Article 84 of the Chicago Convention, and claimed that this was an attempt by the neighbouring countries to terrorise travellers. The blockading nations, on the other hand, started by arguing that the ICAO did not have jurisdiction (under Article 84) to adjudicate in the matter, as the dispute in question was political in nature. This line of argument brings about a strong resemblance with Russia's claims before the WTO during *Russia – Measures Concerning Traffic in Transit*, where the WTO's lack of jurisdiction was argued. In this context, the appeal reached the International Court of Justice (ICJ), and the Court ruled that the ICAO, as the primary authority established under the Chicago Convention to which the nations voluntarily submitted themselves to, would indeed have the authority to adjudicate. However, before the ICAO could adjudicate on the merits of the case and give a final ruling, the disputing countries resolved the same via political negotiations.

Thus, these two instances of conflict regarding international aviation clearly highlight the differences between the WTO and ICAO regimes. On one hand, the security exceptions provided under international trade law are broader in nature, with seemingly much more discretion provided to the invoking States. Under GATT, GATS, or TRIPS, the countries taking recourse to the security exceptions can take any measure that 'it considers necessary', and there need not be an instance of war or other armed conflict – even an 'emergency in international relations' would suffice. Compared to that, Article 89 of the Chicago Convention is much stricter in nature, only allowing derogation from established norms in cases of actual war, or a declared national emergency that has been notified to the ICAO Council. However, the ground reality regarding the adjudication of these provisions is starkly different. As the recent instances of invocation have shown, the WTO puts more focus on its role as adjudicator, and in all disputes regarding security exceptions brought before it, it has upheld a certain standard of review and given a ruling on the merits of the case. Conversely, the ICAO has less focus on its adjudicatory role, and even while adjudicating on the Qatar airspace blockade dispute, it did not analyse the justiciability of the invocation of Article 89, even though no obvious instance of war or national emergency was there in the Gulf region.

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Trade vs. Aviation Law – A Harmonical Approach

Since the 2010s, an increasing trend of protectionism can be noticed in the international arena, and this trend has impacted all sectors of international law, including but not limited to trade and aviation. In terms of international trade law, the increasing frequency of invocation of the security exceptions by the powerful nations, combined with the deadlock situation in the WTO due to a defunct appellate system, has contributed to the crisis. Considering how the trade restrictions often inevitably spill into aviation-related restrictions justified on security grounds, the scope of the issue also involves ICAO jurisdiction. While both institutions operate on the same fundamental principles of transparency, non-discrimination, equality, and a rule-based approach towards international coordination, due to their normative misalignment and institutional and judicial gaps, neither of them seems capable of tackling the issue.

There are some fundamental differences in how the WTO and the ICAO operate as quasi-regulatory bodies. The WTO is primarily an adjudicatory body, and through the decades, it has cultivated a well-established binding two-stage dispute settlement mechanism. The ICAO, on the other hand, is primarily a technical body, focusing on coordination, safety, security, and global facilitation, and not on judicial enforcement. While dispute resolution is permitted through the ICAO Council, there are no established standards regarding the same. Thus, when a dispute arises that impacts both trade and aviation, it enables the States to 'forum shop', particularly in the current geopolitical climate. In the current context, the States are approaching WTO as it has already been proven that its 'minimally satisfactory' standards regarding the security exception invocation are easy to comply with, and avoiding the ICAO altogether, even though core air navigation principles are affected. Conversely, a State may also choose to use the ICAO defence due to less stringent adjudicatory standards, and try to avoid the WTO's more demanding scrutiny.

Overall, the practical consequences of such forum shopping are concerning. Due to the legal and institutional conflict and uncertainty between these two spheres, the rights and obligations of the States under the different international legal instruments remain unclear. Even in cases of established norms, States may suddenly find themselves at a disadvantaged position due to the imposition of sudden security-

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based restrictions. Such conflicts and potential for misuse weaken the regulatory framework of both the WTO and the ICAO systems, giving rise to retaliatory trade and aviation restrictions that erode the established rule-based system. To minimise such conflict and ensure greater coherence, both individual and joint actions are required at the WTO and the ICAO levels.

The dispute resolution systems at both the WTO and the ICAO levels are in need of reform. The WTO, after more than two decades of success, is now bound by a defunct Appellate Body due to the US opposition to the appointment of new members. This has resulted in a trend of the countries appealing 'into the void', and continuing with their trade-restrictive measures. On the other hand, as the Qatar dispute has shown, the ICAO does not have a strong enough adjudicatory process to resolve disputes and implement decisions against the States.

Regarding security exceptions, more scrutiny and clarity are required at all levels. While the WTO has clarified the scope and operation of the security exceptions previously, the standard of burden of proof that it places on the invoking nation is abysmally low, and it facilitates the misuse of the provisions by the member States. On the other hand, while the standards of Article 89 of the Chicago Convention are stricter, there is no interpretative guidance that clarifies the permissible scope and limits of Article 89 derogations. This can be cured by soft law instruments published by the ICAO, which would go a long way towards the jurisprudential development of this provision.

Finally, there is an ardent need for cross-institutional dialogue and cohesive notification protocols between the WTO and the ICAO. For example, a requirement may be enforced that if a nation invokes the security exceptions before the WTO and it involves an aviation-related restriction, a parallel communication would need to be submitted to the ICAO under Article 89. In this way, transparency across both regimes may be ensured, which would strengthen and facilitate global coordination and cooperation in both trade and aviation.

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* The author is an Assistant Professor at the WB National University of Juridical Sciences, Kolkata. She is also pursuing her Ph.D. in trade law at the National Law School of India University, Bengaluru.

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